

4:  
50X1-HUM

SECTION VIII. THE RHINE VALLEY TROUGH, ITS EDGE ZONES  
AND THE NEIGHBORING AREAS OF STEP TOPOGRAPHY

For purposes of a geological-structural review, this large area is divided into the Upper Rhenish plains, old mountain cores on both sides of the Rhine valley trough, the Lorraine step terrain, and the Swabian - Franconian step terrain.

The descriptions of the individual deposits are compiled according to these regions, and arranged within these regions in the order of their magmatic origin.

The relationships between the geological factors and the deposit formations are taken up both within the scope of small units and on the basis of the area as a whole. An attempt has also been made to follow these phenomena throughout the entire vertical extent of the earth's crust.

The influence of the Varistian orogenesis is of the greatest importance for general geological and tectonic conditions, for the mineral- and rock-forming processes, and above all, for the formation and distribution of the ore deposits. Most of the magmatic ore and mineral deposits appear in the plutonic shales and in the vicinity of the channels of the denuded anticlines of the granitic magmata, and fit into the Varistian structures.

Old mountain cores and denuded anticline zones of the magma can also be recognized below the covering mountains. All hydrothermal ore and mineral deposits in mesozoic and Tertiary rocks are secondary conversions of originally Varistian deposits. The Saxonian motion of Varistian faults made it possible for ascendant CO<sub>2</sub>-containing thermal springs, which, as post-volcanic processes of a Tertiary plutonism, occurred very widely, to redissolve the Varistian ore veins in the base mountains and to transport them into the younger covering mountains. There these dissolved substances were redeposited in the form of telethermal ore and mineral veins and telethermal metasomatic deposits of zinc and lead ore and iron and manganese ore.

These mobilized deposits are connected to specific zones which are closely adjacent to the arc of volcanoes and the saddle valley of the Rhenish shield. Most of the carbonated mineral springs of the present-day still originate from these same zones.

Nearly all the magmatic ore and mineral deposits of the Variscan mineralization were eventually formed in this manner.

The nickeliferous pyrrhotite deposits of Todtmoos and Horbach are exceptions, since they originated in the Caledonian with the basic decomposition products of gneiss. Another exception is the niobium contact deposit bound to the anorthite of the Kaiserstuhl, the only representative of a primary Saxonian mineralization.

The sedimentary deposits, with the exception of the iron ore deposits of the Saar and the sedimentary deposits of the Rhine valley trough, are restricted to the step formations to the right and to the left, in the vicinity of the former coastline. Specifically, the sedimentary deposits are dependent on the paleogeographic conditions. In most cases a number of special conditions had to act in conjunction to cause the formation of the deposits. These conditions are discussed in detail.